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THE CHANGE CONTINUUM AND ITS RELATION TO THE ILLINOIS PLAN FOR PROGRAM DEVELOPMENT FOR GIFTED CHILDREN.

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THE PROCESS OF TRANSLATING EDUCATIONAL RESEARCH INTO IMPROVED EDUCATIONAL PRACTICE IS DEFINED IN A FOUR-PHASE LINEAR TAXONOMY OF RESEARCH, DEVELOPMENT, DIFFUSION, AND ADOPTION. A SCHEMA DEVELOPING THESE PHASES OF THE CHANGE CONTINUUM DEFINES SPECIFIC OBJECTIVES, CRITERIA FOR EVALUATION, AND RELATION TO CHANGE. RESEARCH ACTIVITY IS LIMITED TO INQUIRY AND EXPERIMENTATION. DEVELOPMENT ACTIVITY INCLUDES THE INVENTION BASED ON RESEARCH AND THE DESIGN FOR INNOVATION OF THE INVENTION. TEACHER PARTICIPATION IN THIS DEVELOPMENT PROCESS IS ENCOURAGED. DIFFUSION ACTIVITY INVOLVES THE CREATION OF AWARENESS OF THE INVENTION AMONG POTENTIAL USERS. ADOPTION ACTIVITY INCLUDES TRIAL OR TEST OF FEASIBILITY, INSTALLATION OF THE INNOVATION, AND INSTITUTIONALIZATION (PROCESS BY WHICH THE INNOVATION BECOMES AN INTEGRATED AND ACCEPTED COMPONENT OF THE EDUCATIONAL PROGRAM). AN ILLUSTRATIVE CRITIQUE OF THE ILLINOIS PLAN FOR PROGRAM DEVELOPMENT FOR GIFTED CHILDREN IS INCLUDED WHICH ASSESSES THE PLAN IN RELATION TO THE FOUR MAJOR TAXONOMIC PHASES. THIS PAPER WAS DELIVERED TO A CONFERENCE ON EDUCATIONAL CHANGE (URBANA, MARCH 1, 1966). (JK)

THE CHANGE CONTINUUM AND ITS RELATION TO THE ILLINOIS PLAN FOR PROGRAM DEVELOPMENT FOR GIFTED CHILDREN

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My purpose this morning is twofold: (1) to outline for your consideration a paradigm or schema of processes related to change in education, and (2) to apply this schema to a consideration of the Illinois Plan for Program Development for Gifted Children. The first of these two tasks will be relatively simple for me since the schema which I will present is one which my colleague, David L. Clark, and I have been working on for some time and which we have already described on several previous occasions.[1] The second task will be more difficult for me to accomplish without doing violence to the Illinois Plan since my knowledge of the Plan is limited to what I have read about it. I do not have any firsthand experience with its operation nor have I visited any of the demonstration or experimental project sites. I hope you will not hold me too closely on details, therefore, and consider my exposition mainly as an exercise in applying the change paradigm in a real-life situation, rather than as a valid critique of the Plan. I will apologize beforehand to the project staff for the inevitable misinterpretations which I will make.

The Change Paradigm

Although educational research as a field began before the turn of the century, perhaps with the studies of Joseph L. Rice, it has been only during the past decade that educational research has come into its

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[1]See in particular our paper, "An Examination of Potential Change Roles in Education," presented at the NEA-CSI Seminar on Innovation in Planning School Curricula, Aerlie House, Virginia, October, 1965 (mimeo).

own. With the passage of the Cooperative Research Act in 1954, coupled with various provisions of the National Defense Education Act of 1958, educational research became big business. As funds became available, more and more persons in the field of education were drawn into the pursuit of research. Many agencies dedicated to educational research, such as educational research bureaus housed in universities, have emerged: thus, from two-thirds to three-fourths of the educational research bureaus now in existence have gotten underway since 1960. A demand has arisen for research personnel, particularly research administrators, from public school systems and from state departments of education. All around us, then, we see exciting signs of a prodigious expansion in research activity in the field of education.

This fantastic expansion of the research enterprise has been accompanied by a growing feeling that somehow, research ought to be translated into improved educational practice. That such translation has in fact not occurred is just as obvious as is the fact that the research enterprise has greatly enlarged. Over the past decade, particularly under the impetus of criticism that has engulfed the public schools since Russia's first satellite, we have become increasingly aware of the great gap between research and theory, on the one hand, and educational practice on the other. The findings of Paul Mort concerning the 50 year educational lag have taken on more and more relevance. The study of educational innovation in New York State, undertaken by Henry M. Brickell, has further illustrated the enlarging chasm between what we know how to do and what we actually do. Our growing sense of frustration over our obvious incompetence to deal with this problem has resulted, as one might predict

from psychological theory, in a widespread hostile and agressive reaction between scholars and practitioners. So the practitioners insist that blame for the failure to close the theory-practice gap may be placed squarely at the feet of the ivoried-tower, cloud-nining, impractical, dreaming, "mere" theoreticians; while the scholars, on the other hand, defend themselves by pointing to the failure of the short-sighted, fly-by-the-seat-of-the-pants, pencil-pushing practitioners to keep up with the findings of research and to translate them into practical applications.

This appalling situation is likely to grow much worse before it gets any better. That the theory-practice gulf will be enlarged even further than it already exists is almost assured by the passage of the Elementary and Secondary Education Act of 1965. This federal legislation, long overdue, and certainly very much needed, will nevertheless have the short term effect of greatly accentuating the deplorable lack of communication between theoreticians and practitioners. Great gains have been made over the past decade because of the availability of funds from sources that I mentioned earlier, but we are now confronted with the necessity of spending wisely in one year more money than has been available for similar purposes during the entire preceding eventful decade. It strikes me that we have neither the man-power, the institutional resources, nor the vision to rise to this challange unless we are ready to take a hard look at ourselves and at the concepts which have guided our activity heretofore.

It seems to me that the hostility which is being expressed by practitioners toward researchers, and by researchers toward practitioners, is not without some basis on both sides. Practitioners have in fact been heavily

oriented to day-to-day problems. They have worked overly hard to protect their vested interests. They have defended the status quo and have often bitterly attacked those who proposed changes. They have offered up the stereotype of the autonomous classroom teacher as an excuse to keep new ideas and new practices from penetrating into the classroom. But of course, researchers have been equally guilty. They have assiduously avoided addressing themselves to problems of import to the practitioner.. They have insisted upon studying only those problems which were amenable to study by their cherished laboratory methods. They have produced a literature full of conflicts and contradictions, so that anyone intending to improve his practice by applying what is to be learned from research is necessarily frustrated and immobilized.

Despite the fact that these charges can be made and substantiated on both sides, it seems to me that the real crux of the problem, the real explanation for our failure to close the theory-practice gap, does not lie in these factors but instead can be explained in our failure to construct suitable mechanisms and agencies which bridge the gap between the researcher and the practitioner. This contention can perhaps best be exemplified by reference to another area of activity in which, it seems to me, the problem has been more adequately faced. I refer to the area of agriculture and the Agricultural Extension Service. It would not occur to us to ask a farmer, even one holding a Bachelor of Science degree in agriculture, to subscribe to professional journals in agronomy, in the hope that by reading them he might uncover applications which would assist him in doing a better job of farming. Nor would we ask the agronomist to leave his laboratory regularly in order to work directly with farmers in

helping them to improve their farming practices. We realize at once in this example that practicing farmers and research agronomists have very little to say to one another and that to require them to engage in some kind of dialogue would be a dreadful waste of time. Instead, we devise a suitable means of communication between these two groups. The Agricultural Extension Service provides laboratories in which agronomists and other basic researchers in the field of agriculture may carry out the experiments which their scientific interests indicate ought to be pursued. The agronomists, far from talking directly to a farmer, talk instead to a University-based extension specialist who is himself a professor. The extension specialist talks to county agents, who in turn deal primarily with a selected group of farmers in their counties who may be thought of as innovators or cosmopolites. These innovators in turn act as demonstration agents for the remainder of the farmers in the district. Only at this stage does the large mass of farmers come into contact with the ideas that were originally developed in the agronomists' laboratory. Moreover, should the farmer decide that he wishes to adopt the innovation for his own use, he need only call the Soil Conservation Service to have available to him a large coterie of technical helpers who will assist him in adapting the innovation to the circumstances and conditions of his own farm.

It is obvious that we need some kind of similar agency in education if we are to have any hope of closing the theory-practice gap. Now I am not necessarily proposing an educational extension service which is parallel in every regard to the Agricultural Extension Service. There are after all a good many rather fundamental differences between the agricultural enterprise and the educational enterprise. In agriculture, we are dealing

with a private entrepreneur, the individual farmer, who can make his own decisions regarding the practice which he will follow. In education, we are speaking instead of a vastly complicated bureaucracy, whose every decision must be entered into and concurred with by a wide variety of administrative, fiscal, technical, and supporting personnel. The product of the farm is easy to see and to assess; there is no real difficulty in determining whether the farmer's yield of corn this year is more or less substantial than it was last. The effects of innovations can be directly observed. In education, the nature of the product is much more ambiguous; we are of course interested in producing an educated child, but what constitutes an educated child, and how one can measure whether a given child measures up to any standard of education which we might propose, is a vastly complicated problem. The motive of the farmer is clearly economic; the motive of the school is social. All of these differences are suggestive of the fact that whatever mechanism we may develop in education, it is likely to be rather different than that mechanism which we have found to be so successful in agriculture. Nevertheless, there can be no doubt that mechanisms are needed, and we obviously need to start now to conceptualize and to build them.

The problem of conceptualization is a particularly knotty one. Perhaps it is most convenient in thinking about it to return for a moment to the Education Act. This Act, as I see it, is intended to improve schools by fostering innovative thinking and getting that thinking into usable, practical forms. Obviously a great many activities are possible under the terms of the Act. These activities vary in their nature, i.e., each rests on a separate conceptual base, has different objectives, each has different criteria which are suitable to determining whether the objectives are met

in any instance, and each must be assessed or evaluated by methods which are peculiarly appropriate to its own objectives and criteria.

It would be very helpful to have available a taxonomy of such activities, together with their objectives and criteria to guide our thinking. I should like to propose for this purpose a taxonomy which is illustrated in the diagram which has been passed to you. (Figure 1). This taxonomy is organized to depict a continuum of change from research into action.

The first activity described in the schema is research. I will stipulate that the objective of research is to advance or extend knowledge. It does not matter to a researcher whether that new knowledge now has or ever will have a practical application; indeed, to require such applicability is to foist onto research a criterion which is entirely inappropriate to it. For if the object of research is to advance knowledge, then the only suitable criterion is validity. All I have the right to ask a researcher is the extent to which his findings are unequivocal and unconfounded (i.e., internal validity), and to what population they may be generalized (i.e., external validity). Moreover I cannot expect the researcher to influence change in any programmatic way; the relation of research to change is that it <u>may</u> provide a basis for innovation if anyone else chooses to capitalize on the research and is clever enough to develop an application from it. But this is an "iffy" question; it is fortuitous if an application is made. It is clearly not an expectation that we can legitimately hold for researchers that they themselves provide such applications. I'm not suggesting, of course, that researchers <u>should not</u> provide applications if they are of mind to do so; I am saying that it is not too legitimate to <u>expect</u> them to do so. The essential activities of research are inquiry and experimentation, and nothing else.

FIGURE I

A CLASSIFICATION SCHEMA OF PROCESSES RELATED TO AND NECESSARY FOR CHANGE IN EDUCATION

	RESEARCH	DEVELOPMENT		DIFFUSION		ADOPTION		
		INVENTION	DESIGN	DISSEMINATION	DEMONSTRATION	TRIAL	INSTALLATION	INSTITUTIONALIZATION
OBJECTIVE	To advance knowledge	To formulate a new solution to an operating problem or to a class of operating problems, i.e., to innovate	To order and to systematize the components of the invented solution; to construct an innovation package for institutional use, i.e., to engineer	To create widespread awareness of the invention among practitioners, i.e., to inform	To afford an opportunity to examine and assess operating qualities of the invention, i.e., to build conviction	To build familiarity with the invention and provide a basis for assessing the quality, value, fit, and utility of the invention in a particular institution, i.e., to test	To fit the characteristics of the invention to the characteristics of the adopting institution, i.e., to operationalize	To assimilate the invention as an integral and accepted component of the system, i.e., to establish
CRITERIA	Validity (internal and external)	Face Validity (appropriateness) --- Estimated Viability --- Impact (relative contribution)	Institutional Feasibility --- Generalizability --- Performance	Intelligibility --- Fidelity --- Pervasiveness --- Impact (extent to which it affects key targets)	Credibility --- Convenience --- Evidential Assessment	Adaptability --- Feasibility --- Action	Effectiveness --- Efficiency ---	Continuity --- Valuation --- Support
RELATION TO CHANGE	Provides basis for invention	Produces the invention	Engineers and packages the invention	Informs about the invention	Builds conviction about the invention	Tries out the invention in the context of a particular situation	Operationalizes the invention for use in a specific institution	Establishes the invention as a part of an ongoing program; converts it to a "non-innovation"

Obviously then, I will need someone who will undertake the development of applications. I will refer to this as the development activity, as shown in the second major column of the schema. Development in turn may be considered in terms of two sub-activities: invention and design. I will stipulate that the objective of invention is to formulate a new solution to an operating problem. This formulation can be based either on research, experience, or even mere intuition; and while we may argue that inventions based upon research are more likely to be successful in the long run, it is clearly unnecessary to require that they be so based. Indeed, in view of the low state of the research art at this moment, it would be foolhardy to suppose that most practical problems can be solved simply through recourse to already completed research.

What are the criteria by which an invention may be judged? it seems to me that there are three: face validity, viability, and impact. The question of face validity has to do with whether the proposed solution to the problem shows reasonable promise. The question of viability has to do with whether the proposed solution can be expected to survive and flourish under normal conditions. The question of impact is one of potential significance to education of the invention. These are certainly gross criteria but it is better to err on the side of permissiveness at the invention stage than to cut off good ideas too soon. The essential activity of invention is the creation of an innovation, and nothing else. Invention in short produces the innovation in its initial conceptualized form.

The second type of developmental activity is design. The purpose of design is to order and systematize the components of the invented solution into an innovation package suitable for institutional use.

What criteria are relevant to such an activity? First, we are concerned with how well the development works in the context of conditions to which it is exposed, i.e., how well does it perform? Second, we are concerned with institutional feasibility of the invention, i.e., its capability for being adapted into a variety of situational contexts. Finally, we are concerned with the invention's generalizability, i. e., the range of school situations into which it is possible to introduce the invention. The essential activities of design are engineering and packaging. Engineering is required to order and to systematize the components of the invented solution while packaging is necessary to render the innovation into marketable form.

I use the words "engineering" and "packaging" deliberately because these seem to be two words which illicit a very hostile reaction from most educators when they are first heard. These two terms seem to catch up at their worst all of the educator's fears that he is being manipulated, that his inventiveness and creativity are being curtailed, that he is being dictated to in terms of his classroom procedures. It seems to me however, that engineering and packaging can be carried on in ways which obviate these possible faults. While it is certainly possible to engineer an invention without ever consulting a teacher or other educational practitioner, it is obviously equally possible to engineer inventions utilizing a high degree of involvement on the part of teachers. Thus, on the one hand, teachers may be used merely as guinea pigs on which the engineered invention may be field tested; but on the other hand, teachers may be used in roles that are highly creative, leaving it to the "experts" merely to add the technical nuances that give the package its final professional form. I, for one, am perfectly willing to allow the degree of

involvement of teachers in the design of innovations to vary broadly from project to project, hoping that we can collect sufficient empirical evidence over a relatively short period of time to guide us in a determination of what degree of involvement is best.

Similarly, there is no need to assume that the packaging of inventions implies a massive, inflexible program which the teacher must adopt whole hog or not at all. We have a number of examples of such packages now currently available, and perhaps it is because of these extant packages that teachers seem to assume that all packages must be of this inflexible sort. Thus, teachers adopting the PSSC materials in physics or the SMSG materials in mathematics must accept these packages pretty much on an all or none basis; the classroom teacher has literally no control over the scope, sequence, or continuity of the materials once she has made the decision to use them. But obviously, other approaches are possible. As I am sure you all know, film makers are now producing so-called single concept films which treat, as the name implies, a single concept at a time. So for example, in relation to a course in biology, we find available a single concept film on osmosis. This film, running in a continuous loop for about three minutes, illustrates the process of osmosis by showing how a fluid colored red which is separated by a permeable membrane from a similar uncolored fluid will gradually work its way through that membrane, resulting in a pinkish fluid on both sides. It is obviously possible to join such single concept films with single concept programs for teaching machines, with single concept printed brochures, and indeed, even with single concept tests, which the teacher may use to evaluate whether or not the particular concept has been learned. Obviously, a course could be developed around a whole series of such single

concept materials, which the teacher could sample to any degree she wished, in any order she wished and elaborated in any way that she wished. Again, we see that it is possible to develop packaged materials on a variety of levels of flexibility, and again, I for one am perfectly willing to allow the question of what the ideal level of flexibility is to be settled by empirical data.

What is the relation of developmental activity to change? Obviously it is this activity, and not research, which is at the heart of change, for while research may make change possible, it is development that actually produces an innovation that may be adopted. But just as it is not, except by chance, the researcher's task to produce development, so it is not the developer's task, except by chance, to diffuse the now developed invention. For this purpose we need other kinds of specialists.

Before a development can achieve adoption, practitioners must know about it, they must be possessed of the facts concerning its feasibility and performance, and they must be possessed of the facts concerning the nature of the process whereby the development may be installed and institutionalized. This is the job of diffusion specialists as illustrated in the third major column of the schema. Again, this activity has two dimensions: dissemination and demonstration. It is the purpose of dissemination to create widespread awareness of the invention among practitioners, that is, to inform or tell practitioners about the performance and process aspects of the invention. The criteria which are appropriate for the evaluation of dissemination activities include intelligibility (is the message clear?), fidelity (does the message give a valid picture?), pervasiveness (does the message reach its intended audience?), and impact (does the message affect key targets?). The essential activities of dissemination are reporting and interpreting; these activities perform the function of informing about the innovation.

But simple dissemination may not be enough. Extension agents in agriculture, for example, know full well that it is not sufficient to tell farmers about the advantages of hybrid seed corn or to furnish them with tables of information which illustrate the large increases in productivity that may be expected when such corn is used. Farmers need to examine and assess the operating qualities of the invented corn for themselves. This seems to me to be best defined as a demonstration function, the second aspect of diffusion as indicated in the table. The criteria appropriate to an evaluation of demonstration functions thus seem to me to include credibility (is the demonstration convincing and does it build conviction?), convenience (is the demonstration accessible to those practitioners who ought to see it?), and evidential assessment (does the demonstration illustrate both positive and negative factors related to the invention so that the observer may reach a valid professional judgment about its utility?). The essential activities of demonstration are production and staging, and its purpose is to build well-founded professional conviction in relation to the innovation.

We come then finally to the stage at which the invention may actually be incorporated into a functioning school system. This stage, adoption, is the fourth major column of the schema, and is in turn sub-divided into three activities: trial, installation, and institutionalization. In the trial stage the invention is introduced as an evaluation basis to determine its quality, fit, and utility in the particular situation to test it out under local conditions. Criteria suitable to this stage are adaptability to the local situation, operational feasibility in the local situation, and performance or action under the particular special circumstances.

The objective of the installation activity is to adapt the innovation to an adopting school, once it has held up successfully in the trial stage. This activity is rather like that performed by Sears when you purchase a washing machine. The washer must be delivered to your home, it must be hooked up to available sources of water and power and to sewer lines, and the housewife must be taught to operate it. The criteria of whether the installation has been successfully accomplished seem to me to be those of effectiveness and efficiency. To follow my homely washer example, whether or not the housewife is satisfied with the washer is determined by the effectiveness with which it washes her clothes and the efficiency with which it gets the job done. Thus, installation operationalizes the innovation, and its essential activities are introduction and accommodation to the school, on the one hand, and familiarization of the teaching or other staff with the innovation, on the other hand.

Housewives have been known to return washers to Sears even after they have been properly installed. It is important to render the invention into an integrated and accepted component of the school if it is to survive for any reasonable period of time. This objective seems to me to be the proper function of what is described in the schema as the institutionalization phase. At its most successful level, institutionalization is that activity which regularizes the innovation, i e., converts it into a "non-innovation." The appropriate criteria for determining whether institutionalization has been accomplished are three, it seems to me: continuity (does the innovation persist over time in the school?), valuation (do the personnel associated with the innovation, i.e., teachers, administrators, pupils, parents, etc., place a high value upon it and are they willing to undergo personal discomforts

rather than to permit the innovation to be removed?), and support (is this school willing to devote a reasonable portion of its budget and other resources to the support of the innovation?).

In very brief form then, the chart before you contains a definition of a research-action taxonomy which may serve as the basis for conceptualizing a variety of mechanisms and agencies producing change in schools. The table makes it clear that a variety of activities exists along the research-action continuum, that each of these activities has its own peculiar objective, and that each of these objectives is judged by different criteria. The objectives and criteria for research are not the same as for development, and these in turn differ from those appropriate to diffusion or adoption. This is the crucial distinction and onewhich is very often misunderstood.

For the sake of clarity let me now make some additional points about this chart.

1. You may have noted that the chart does not make any explicit reference to evaluation. It should be clear however that evaluation is appropriate to each of the activities which are defined by the chart, since each activity has its own particular objective, and it has its own particular criteria in terms of which the attainment of that objective may be judged. Thus research may be evaluated in terms of its internal and external validity, invention may be judged in terms of its face validity and estimated viability, etc. I should like to define those evaluations which are undertaken in relation to development, diffusion, or adoption activities as field studies. It is imperative not to confuse field studies with research, since field studies obviously are not designed to produce new knowledge but to furnish assessments about the

relative success of particular activities along the research-action continuum. Field studies are not essentially experimental or manipulative in nature, so that it seems to me entirely inappropriate, when casting about for logical or statistical designs with which to carry out the field studies, to turn to the classic experimental designs which were developed for, and intended for use in, experimental research situations. It is true that field studies and experimental research do both employ rather analogous activities, as for example, the use of certain instrumentation, somewhat similar methods of collecting and analyzing data, and the like; but in the case of field studies, I prefer to think of such activities as "research-like," to distinguish them from the techniques that are used in experimentation.

2. While I am on the subject of field studies I would like to differentiate them from demonstrations with which they are also frequently confused. Indeed, it is common practice when an innovation or invention is proposed to mount some kind of field activity which is designated as a demonstration but which has as one of its purposes the testing of the innovation itself. Henry M. Brickell in his well known study of innovation in New York State was one of the first to point out the essential differences between the development, field testing, and demonstration of an innovation, but while his work is widely read, his recommendations apparently have not been generally heeded. To illustrate how ludicrous the attempt to combine field studies and demonstrations is, we need only think of the chemistry teacher performing a demonstration before his class. It is clear that what the instructor is attempting to do is to illustrate to his class the working of some already well-known chemical principle. We would not expect that he would simultaneously be attempting to establish the validity of the principle

that he was demonstrating; and indeed, if that were his intention, we would not be terribly surprised to find that his class had evacuated the room while awaiting the results of the test. For some inexplicable reason however it does not seem to us to be inappropriate for an educator to be carrying out a demonstration of an educational principle or practice whose effectiveness, performance, or operating characteristics he did not know well in advance of the demonstration. It does not surprise me, therefore, that many demonstrations are held to be unconvincing, since it is obvious that even the best developed innovations must from time to time be found unfeasible, not viable, or ineffective.

3. Another point of clarification that I wish to make regarding the diagram is to point out that what appears to be an inherent logic running from the left of the diagram to the right of the diagram does not necessarily hold in real life. Thus, it is not my contention that every activity necessarily begins with research, moves then through development, diffusion, and adoption stages into some kind of well established practice. Obviously there are a variety of feedback loops which are possible. In the first place, it is unnecessary to suppose that every activity begins with research. Research, as I have now often pointed out, may be entirely lacking in a given area, or may be so conflicting or ambiguous as to be of little help in the practical situation. It is thus not unlikely that an invention based almost entirely on experience or intuition may be developed, and that only through the attempts to put that invention into practice will we uncover the researchable questions which can then be pursued further in the laboratory. It is obviously also possible for a breakdown to occur at any stage in this process; thus an attempt to install an innovation in a real school system may reveal certain

fundamental flaws in its design which did not become apparent before this point. We may thus be forced into looping back to the design stage in order to rectify the error before proceeding further. It might therefore be more convenient to think of the categories of the diagram as actually falling upon a circle so that one can proceed from any stage to any other stage without the necessity of returning always to an identical starting point.

4. A fourth and final point of clarification which I would like to make about the diagram is to point out that obviously these categories are artificial and arbitrary. They happen, in fact, to be the most recent stage of thinking which our discussions have led Dr. Clark and me to formulate. The question of the research-action continuum is one which has intrigued us for some time, and one about which we have had many lively arguments. We are by no means convinced that the present formulation is the best one that we can come up with; and we are very convinced that if it is an adequate formulation, it will very quickly lead into a better one, just as the best theories often have the shortest lives because they provide the basis for the most rapid advances of a science. If it should turn out that you do not like the particular formulations that we have reached, you are of course at liberty to produce your own, in the same way that modern geometrists, dissatisfied with the formulations of Euclid, have resorted to new formulations which, we may note in passing, have for certain purposes turned out to be more instructive and useful than Euclidian geometry. The point that I wish to make today is that it is vitally essential that we move ahead on <u>some</u> conceptualization of the activities which intervene between research and practice so that we can begin to formulate the mechanisms and agencies which are essential to carrying out these intermediate objectives.

Application of the Change Paradigm to the Illinois Plan

Let me turn then from an examination of the paradigm to its application to the Illinois Plan, which is one example of a mechanism for reducing the research-practice gap.

While I am sure that most of you are generally familiar with this Plan, I cannot presume that you are sufficiently familiar with its details so that I can talk about them without having refreshed your memories somewhat. In order to accomplish this refreshment without having to make a time-consuming detour to do so, I have adopted the strategy of confining my remarks entirely to a single booklet which gives an overview of the project as it was conceived at its inception, "The Illinois Plan for Program Development for Gifted Children; Initial Plans for 1963-65," as published by the Office of the Superintendent of Public Instruction, State of Illinois. The booklet is sufficiently brief so that I can read it to you and comment upon those parts that seem especially interesting.

Selection A:

ORIGINS OF THE ILLINOIS PLAN

> In 1959, on the recommendations of the Illinois School Problems Commission, the General Assembly established the Special Study Project for Gifted Children. The purpose of the Special Study Project, which operated from 1959 to 1963, was to secure data, information and recommendations to assist the General Assembly to determine whether permanent legislation to assist districts in providing for gifted children is needed and desired, and the nature of such legislation, if desired.

Comment: Apparently an action problem or class of problems relating to gifted children has been identified by someone as meriting attention. The problem was sufficiently important, it was judged, that

special legislation might be required. Information was needed and a special study group was set up to get it. The nature of the action problem is undefined; one important consequence of this failure is that we cannot really judge the face validity, estimated viability, or relative impact of any proposed solution to it.

Selection B:

> Under two successive biennial appropriations of $150,000.00 each, the Special Study Project supported a total of forty-four study projects in school districts and universities. A leading scholar, Dr. J. J. Gallagher of the University of Illinois, was commissioned to prepare a comprehensive analysis of previous research related to the education of gifted children, with recommendations for state action. The Project staff conducted a survey of Illinois schools in 1959-60, using questionnaire and interview techniques to assess the current status of programs and provisions for gifted children in the public schools.

Comment: Apparently a series of studies were carried out by the Special Project. How many of these were status studies and how many were research in the sense of the schema is unknown from this document. Two outcomes are stated: (1) an analysis of existing research was made, and (2) a status study of existing practices in Illinois schools was completed. We do not know from this statement to what extent the final recommendations were based on this work. We may speculate that the existing research was not found to be very useful, at least at the operational level, and that existing practices were probably of great interest and utility. Whether or not research data supporting the practices which were finally adopted were in fact found is a moot question.

Selection C:

An Advisory Committee of highly qualified educators employed the data and recommendations of the study projects, the Gallagher report and their own experience in drafting a preliminary set of recommendations for state action. Members of the Advisory Committee who participated in formulating the Illinois Plan were: (nine public school and four University staff members are listed). Ex-Officio Members, Office of the Superintendent of Public Instruction were: (five state department staff members are listed). The members of the Project Staff were: (two University of Illinois staff members are listed).

Comment: The recommendations, i.e., the invented solutions to the problem, were finally made by a special advisory committee, of whose technical competence we are assured in the phrase "highly qualified educators." These recommendations were based upon the information provided by the Special Project staff. Wide-spread involvement in formulating these recommendations is not evident, except insofar as the judgments and opinions of a broad group may have been tapped through the 44 studies carried out by the Special Project.

Selection D:

The preliminary recommendations were presented to leaders of educational, civic, professional, labor, industrial, and social service groups at a series of five Governor's Conferences on Developing the Talents of Illinois Youth in May, 1962. Governor Otto Kerner gave the keynote address at the Conferences at the University of Chicago and in the State Capitol. The keynote address was delivered by Lt. Governor Samuel Shapiro at Southern Illinois University, Eastern Illinois University, and Rock Island Senior High School. Total attendance at the Govenor's Conferences was 1,300. The reactions of these participants were extremely useful in the further refinement of the recommendations.

Comment: The recommendations were laid open to critique by educators and a number of other important policy groups. This activity helps to legitimize the final recommendations and makes them more binding.

Selection E:

The five recommendations which make up the Illinois Plan were presented to the School Problems Commission at hearings in September and December, 1962. After careful consideration the commission voted to approve the recommendations and to have bills drafted to implement them.

On April 18, 1963, Senator Edward Eberspacher introduced Senate Bill 749 on behalf of the School Problems Commission. Senate Bill 749 was supported actively by the Honorable Ray Page, Superintendent of Public Instruction, who made the proposed Illinois Plan a part of his legislative recommendations. Governor Otto Kerner included the $6.75 million appropriation of Senate Bill 749 in his budget, and the Illinois Plan was made a part of the administration's legislative program.

Senate Bill 749 was passed by both houses of the Seventy-Third General Assembly by unanimous vote. Final approval was given by the Governor on August 5, 1963.

Comment: The recommendations were placed before the legislature with the full sanction of the School Problems Commission, the Superintendent of Public Instruction, and the Governor. The fact that the bill was passed unanimously by both houses indicated extent to which the political aspects of the matter had been attended to. The recommendations now had the force of law, and an appropriate financial backing for carrying them out.

Selection F:

THE FIVE PARTS OF THE ILLINOIS PLAN

1. Reimbursement for Services and Materials (Section 14A-5 S.B. 749

Under this program, any school district in Illinois may submit a plan for improving its services to gifted children. Such proposed plans must set forth clearly and concisely the following features: (1) a description of the population to be served (2) a statement of the qualifications and duties of the special personnel in one or more of these categories: diagnostic services counseling services, and consultative services; (3) a description of the books and materials needed.

Comment: An important step in obtaining adoptions by the schools of whatever programs might ultimately be demonstrated or developed is taken here by the establishment of a plan to reimburse the schools for services and materials necessary. It is interesting to note that the language does not require the school to describe its programs, but simply to describe the population to be served, the personnel who will take part, and the materials needed.

Selection G:

> Such reimbursement for the 1963-65 biennium will be computed by a formula designed to take account of the number of gifted pupils being served and the wealth of the district. The state will pay somewhat more than half of the cost of the special program in districts in which the assessed value per pupil is below the average for the state, and the state will pay somewhat less than half of the cost of the special program in districts in which the assessed value per pupil is above the average of the state. A pre-approval system is being established in which plans submitted by the district will be assessed in light of local district expenses as well as requested state support for the special programs for gifted children. The amounts to be used as per-pupil program costs are based upon experience with special programs in Illinois and other states.

Comment: The district is required by this provision for reimbursement to make a financial commitment to the project for which it seeks help. A large step toward institutionalization is thereby already taken, since the school must obviously value the innovation to make such a commitment.

Selection H:

> A second form of reimbursement provides $5,000 for each professional worker employed full time in the district's program for gifted children.

Comment: A major problem that a school district faces in adopting any innovation is to provide the personnel who are technically competent to perform in relation to it. By providing money for the salaries of professional workers the Plan obviates one of the major objections that might be raised by public schools: lack of appropriate personnel. The feasibility and effectiveness of the innovation is thereby appreciably enhanced in the adoption phase.

Selection 1:

11. Demonstration Centers (Section 14A-6 S.B. 749)

> The major purpose of the demonstration centers is to provide for all Illinois educators and other citizens convincing and readily accessible demonstrations in operating situations of a number of particular approaches to the education of gifted children.

Comment: A second part of the Plan is the establishment of Demonstration Centers. These are to be convincing and readily accessible. The criteria of credibility and convenience are thus taken into account, although we cannot be sure whether they will be met. The criterion of evidential assessment is not mentioned, even by implication. Indeed, we must be careful lest, in their attempt to be convincing, the Centers depend more on salesmanship than on data.

If we take seriously the idea that demonstrations ought to follow only after extensive field studies have indicated the work of the concept being demonstrated, we must wonder whether these proposed Demonstration Centers can in fact be useful.

Selection J:

Description: Demonstration centers exemplify the following approaches:

1. Acceleration of highly gifted pupils.

2. Individualized instruction through such means as team teaching, nongraded plans, independent study.

3. Special classes for the highly gifted, with specially trained teachers and supervisors or consultants.

4. Special attention to gifted youth among socially and culturally underprivileged groups.

5. Curriculum improvement through programs which emphasize higher-level thought processes, creativity, divergent thinking.

6. Special attention to the emotional and social adjustment of gifted pupils.

Comment: It now turns out that the Demonstration Centers are indeed limited in what they may demonstrate. Six particular areas are prescribed. How did these emerge? Are these based upon research, experience, or some other factor? On what grounds do these six areas merit selection? Indeed, what do these six descriptive phrases mean? If I were to demonstrate, say, the acceleration of highly gifted pupils, how would I do it? Where is the design? What components are involved, and how are they ordered and systematized?

Selection K:

Plans call for five or six demonstrations of each approach in school districts in different parts of the state, so that visitors may see any of the approaches within 100 miles of their own schools. Each demonstration center is responsible for showing the program to visitors and for carrying on an evaluation of the program.

Comment: Each approach is to be exemplified in five or six school districts. Apparently the only criterion to be applied is one of geographic distribution so that a potential visitor will find one conveniently located near his own area. But other criteria are also important, e.g., the size and wealth of the district, the number of gifted children served, the quality of the staff, etc. One can only wonder whether visitors will find the Demonstration Center that they visit very credible in terms of their own situations.

Far more important than this probable lack of match between the characteristics of the Demonstration Center and the characteristics of the vistor's own school situation is the fact that each Center is expected to evaluate its own program. Not, mind you, to evaluate the demonstration itself, but the program being demonstrated. Here is a clear example of the tendency which I noted earlier to demonstrate programs whose performance is largely unknown. The damage that might be caused by having one of these supposedly exemplary programs turn out badly is incalculable; obviously, exactly the wrong things might be demonstrated.

Selection 4:

Essential Elements: A demonstration center program may be carried on by a school district, involving the district as a whole or selected grade levels, subject areas, or buildings. Each demonstration center will have the following characteristics:

1. It exemplifies one of the six approaches listed above.

2. It provides regular, systematic evaluation, publishes the results and makes results available to visitors.

3. It is open to visitors, and regular procedures are developed for inviting visitors, explaining the program to them and giving them opportunities to talk with teachers and pupils and to seek such information as they desire.

4. Where possible, each demonstration center is the responsibility of at least one full-time professional staff member of the locat district.

Comment: Again I must point to the fact that no real criteria for the selection of Demonstration Centers are listed. Apparently any school district might qualify. The characteristics which each Center is expected to display are also questionable, viz:

1. Exemplification of one of the six approaches. I have already commented on the difficulty of knowing just what these approaches are. I venture to say that what is being demonstrated, say, in connection with acceleration of highly gifted pupils, would vary enormously.

2. Evaluation. I shall not repeat my caveats in regard to demonstrating the unknown. What results will there be available to visitors if the demonstration and evaluation are carried on concurrently? There is little opportunity here for evidential assessment.

3. Openness to visitors. This is clearly a case of caveat emptor. Let us hope that the visitors will be shrewd enough to ask the right questions. If the right questions are asked, however, it is dubious that they can be answered, since no hard data are available.

4. Staffing. Special staff are undoubtedly necessary in a Demonstration Center, but it is dubious whether one person can do more than act as host or hostess. Who will do the evaluation? Who will do the writing and publishing? Who will develop the program and render it operational? The provision for personnel is extremely inadequate.

Selection M:

III. Experimental Projects (Section 14A-6 S.B. 749)

The major purpose in providing state assistance for experimental projects is to assist school districts to carry on significant experimentation which will advance our knowledge about practical programs for gifted children.

Comment: A third component of the Illinois Plan is the establishment of experimental projects. The introductory sentence to this section talks about advancing knowledge, and so has the flavor of research in the sense of the paradigm. But note that it is not just any knowledge of the gifted that is being sought; it is knowledge about practical programs. Thus we are clearly in the area of development and not of research. The implication seems to be that the six areas designated for Demonstration Center projects are well enough established to require no further inquiry, but that other areas may exist which should be exploited. It is the business of the experimental projects to identify, engineer, and try these.

Selection N:

Essential Elements: An experimental project may be carried on by a local school district, involving the district as a whole, or selected grade levels, subject areas, or school buildings. Each experimental project will have the following characteristics:

1. The new program being employed experimentally is derived from previous research.

2. It illustrates new procedures in the educational process.

3. It includes an evaluation phase based upon the collection of data which will give some measure of the effectiveness of the procedure.

4. Regular provision is made for reporting the results of the experimentation.

Comment: We may well inquire into the capabilities of local school districts to carry on experimental projects. These projects are, as we know from experience, expensive, difficult to staff, and very time-consuming. It is dubious whether any local district has the resources, mainly competent personnel, to carry out such a project.

It is also dubious whether such programs can in fact be based on research, a point I have made before. I assume that the six areas outlined under Demonstration Centers represent the full range of programs that might persumably be found in existing research; if there were other well documented areas they would surely have been included in addition to the six. Much more important here is an inventive idea spawned in an environment that gives some promise that it can be successfully exploited.

It is important to note that in the case of experimental projects provision is made for evaluation before diffusion. Obviously the same precaution should have been taken with those areas already selected for demonstration.

Selection O:

IV. Field Consultants at the State Level (Section 14A-7 S.B.749)

To administer the planned program development for gifted children, including the program of reimbursement, the demonstration centers, and the experimental projects, a Department of Program Development for Gifted Children has been established in the Division of Instructional and Pupil Personnel Services of the Office of the Superintendent of Public Instruction.

A staff of field consultants is being recruited to provide knowledgeable help in the planning and operation of demonstration centers, experimental projects and teacher training activities.

Comment: A fourth major component of the Plan is the provision of personnel at the State Department level who will administer the program and provide help in setting up the several field components. Since their duties are not outlined we cannot know how they will function; perhaps their roles will be similar to those of the agricultural county agents that I outlined earlier. If so a very large staff will be required.

It is crucial to note that this field consultant staff does not render assistance to schools who might wish to adopt one of the programs that are being demonstrated. The local schools are thus on their own in terms of adoption. My guess is that they will turn to the Demonstration Centers for help, thus further overloading an already inadequate staff.

Section P:

V. State Support for Programs to Increase the Number of Specially Trained Personnel

To help meet the great need for specially trained personnel to provide consultative services, including the leadership of in-service work with teachers and diagnostic and counseling services, it is proposed that state support be provided for:

1. A program of fellowships for able persons who are being trained for these positions. (Section 14A-8 S.B.749)

2. One or more academic year institutes. (Section 14A-6 S.B. 749)

3. Several summer institutes. (Section 14A-6 S.B. 749).

The institutes are modeled on National Science Foundation Institutes. Colleges and universities make proposals for institutes, indicating the selection process to be used, the training programs to be offered, and the number of participants to be paid stipends.

Comment: A fifth and final component in the Illinois Plan is the provision of training programs for both pre-service and in-service training. We have alread noted the necessity of making provision for personnel; the reimbursement provision under Point I was one large step in this direction. Now we see that fellowships and institutes are to be furnished as a second step. The nature of these programs is not spelled out, although it is apparent that the interest is in training consultative and leadership rather than operational personnel. The classroom teachers themselves are not directly touched by these provisions. Help for them is thus several training generations away.

Resume

I shall not burden you with the remainder of the booklet from which I have been quoting, since subsequent sections deal mainly with appropriations and central administrative matters. I would like, in conclusion, to take one more quick tour through the paradigm to see how the Illinois Plan shapes up in the terms therein proposed:

1. Research. The relation of the Plan to existing research is moot. We know the research was scrutinized but do not really know to what extent it was useful in predicating the six demonstration areas. Research evidence for the validity of these areas is lacking, at least in this report. No provision is made for additional research, despite the existence of the so-called experimental projects. These latter are clearly development activities, not research activities.

2. Development. No development has occurred in relation to the six areas to be demonstrated. Designs are completely lacking. Instead, we see elaborate efforts to secure legitimation for the selections made through references to literature searchers, status studies, review by a panel of well-qualified educators, and governor's conferences. The various Demonstration Centers are almost at complete liberty to construe the six areas as they please. One may well predict, therefore, the emergence of a wildy heterogenous assortment of demonstrations.

The experimental projects do represent an authentic attempt at development. The outcome of this effort should be more systematic, but probably no more research-related than the first effort.

3. Diffusion. We know very little from the booklet about any systematic attempts at dissemination, except that the Demonstration Centers and the Experimental Projects are expected to publish the results of their activity. Without some coordination and assistance one may expect these efforts to be largely amateurish, directed at diffuse rather than pin-pointed audiences, and relatively haphazard. The intelligibility, pervasiveness, and impact of such dissemination efforts are highly suspect.

The Demonstration Centers are almost the heart of the entire plan, but they fail in several important aspects. First, what is being demonstrated is unproven; demonstrations and field studies are hopelessly confused. Second, the Demonstration Centers are apparently not selected with an eye to credibility but only to convenience. Third, there is little if any possibility of evidential assessment. It is doubtful whether this approach will build credibility in very many persons.

4. Adoption. Adoption has been largely ignored in the Plan except for the provisions for training personnel and for the partial reimbursement of supplies and materials. The local schools are on their own insofar as trying, installing, or institutionalizing any innovations they might wish to adopt. Moreover, the process as set up gives them very little basis for making an intelligent adoption decision. We may predict that adoptions that do occur will be stimulated mainly by the availability of the matching funds, that these new practices will not in fact be ultimately institutionalized, and that during their existence they will not be managed as well as possible.

I must therefore conclude that the Illinois Plan does not hold up very well when assessed in terms of the criteria proposed in the paradigm. I do not believe that the Plan will result in very many innovations being developed and introduced; rather I believe it will have the effect of spreading some existing practices which are reasonably good, at least so long as state subsidies are available.

But I sound much harsher in my judgment than I want to be. There is no doubt that the Illinois Plan has a great deal of merit, if for no other reason, than as a model of how a statewide program can be mounted and steered through the difficult political rapids which it must shoot to become established. The Plan, despite its deficiencies, is one of the few models we have before us, and we have a great deal to learn from it. If subsequent plans are better, they shall owe a great debt to the Illinois Plan for having shown the way. If the deficiencies of this Plan can be used to advantage in improving subsequent plans, it will have won its unique place in educational history.